

Guidelines for Calculating Emissions from Paint, Resin, and Ink Manufacturing Operations

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Beginning with the 1999-2000 Annual Emissions Reporting (AER) cycle, the following guidelines can be used to calculate emissions from paint and ink manufacturing operations.

Emissions calculation methodologies for these operations are outlined in Emission Inventory Improvement Program (EIIP) Guidelines Chapter 8 of Volume II "Preferred and Alternative Methods for Estimating Air Emissions from Paint and Ink Manufacturing Facilities" published by the US Environmental Protection Agency (US EPA) in March 1998. This document identifies the estimating methods and provides examples of how emissions are estimated for paint and ink manufacturing operations. These methods are summarized with additional requirements for the South Coast Air Quality Management District (AQMD) as follows:

Method 1: Mathematical Model

In order to use this emissions estimating method, operator must obtain specific data for all required parameters required by the theoretical models/equations such as chemical/physical properties of the materials involved (e.g., vapor pressure, vapor molecular weight), operating data (e.g., amount of material processed, operating hours), and physical characteristics/properties of the sources (e.g., tank sizes, exhaust flow, mixing speeds, operating temperatures).

AQMD Guidelines and Requirements:

- 1) Operator can apply these models to representative types of products and categories.
- 2) Similar product types must be grouped into four (4) categories by batch size, solids content, and VOC content based on MSDS information.
- 3) At the minimum, specific data from two (2) similar products of each category must be measured on a quarterly basis. The average values can be used to calculate emissions for that product category.
- 4) All measurements and calculations must be included with the final AER.
- 5) The facility using this model must include all emission models applicable to its operations including:
 - (a) Material Loading, Unloading and Product Filling;
 - (b) Heat-Up Losses;
 - (c) Spills;
 - (d) Surface Evaporation Due to Mixing;
 - (e) Gas Sweeping and Purging;
 - (f) Solvent Reclamation;
 - (g) Storage Tank Losses; and
 - (h) Wastewater Treatment Losses.

Method 2 Material Balance

Alternatively, operator can choose to calculate emissions using material balance method. This method requires the totaling of all material received at the plant and then subtracting out all of the known losses or transfers of the material off-site including finished product and waste material.

AQMD Guidelines and Requirements:

Documentation of each stream must be included with the final AER.

Method 3 Source Test Data

Test data is very source specific and uncommon for paint and ink manufacturing facilities. Since source test data is limited to isolated operation in the process, other methods must be used to account for emissions from other operations in manufacturing process.

AQMD Guidelines and Requirements:

Source test data and calculation for all operations must be included in the final AER.

Method 4: AP-42 Emission Factors

Emission factors are commonly used to calculate emissions from paint and ink manufacturing facilities. EPA maintains a compilation of approved emission factors in the AP-42. These are essentially the loss factors that represent emission rates to be applied to a production rate for overall operations in a manufacturing process. The following factors can be used to calculate total VOC emissions:

- 0.034 lb VOC emitted / lb solvent used (newly proposed by EPA); or
- $0.70 * 30$ lbs VOC emitted / ton coating produced.

NOTE: 30 lb VOC emitted / ton coating produced was established by EPA in AP-42 in 1995. This factor is adjusted by 0.70 for the manufacturers in the AQMD due to the rule effectiveness for the last 15 years. Please note that the first factor is applied to the total amount of solvent used in manufacturing process while the second factor is applicable to the facility's total coating produced.

AQMD Guidelines and Requirements:

Records of production and solvent used must be included in the final AER.